The Minnesota Virtual Clinic: Using a Simulated EMR to Teach Medical Students Basic Science and Clinical Concepts

:

Stuart M. Speedie, PhD, Catherine Niewoehner, MD
University of Minnesota Medical School, Minneapolis, MN

Abstract – The Minnesota Virtual Clinic is a web-based educational tool using a simulated EMR to expose students to critical basic science and clinical concepts in the context of patient care. The clinic enrolls a group of simulated patients representing a variety of conditions and cultural backgrounds and follows them over time. Students "attend" the clinic weekly to review the latest developments for its patients. The underlying tools facilitate a variety of educational links for any item of information from simple popup windows for definitions to illustrative images and interactive student exercises. At the same time it provides and introduction to certain informatics practices including basic security and use of an EMR for patient care.

Technology enhanced learning (TEL) can significantly improve the delivery of medical education through its ability to make educational experiences available at any time and in any place. The Minnesota Virtual Clinic is an example of a web-based TEL application that simulates a weekly primary care clinic where students participate in the ongoing virtual care of a group of patients. Its educational mission is to provide a set of patients that illustrate and supplement the material taught in the courses and clerkships of the undergraduate medical curriculum. The interdisciplinary group of faculty who designed the virtual clinic developed a set of detailed longitudinal patient cases that the students could follow over time and that are linked to specific lectures, discussions and class exercises. Examples of patients in the clinic include a pregnant woman who is followed through to delivery and subsequent well-child care. At the other end of the age spectrum the clinic includes a patient who is developing symptoms of Alzheimers, another who is active and healthy but occasionally suffers simple acute problems. Another elderly patient is the father of a younger man with depressive symptoms who is a diabetic with a history of smoking.

Each week students "visit" the clinic by going to the clinic web page, signing in and viewing a simulation of a typical clinic electronic patient record system. This system details the patient's demographic information, past medical history, family history, social history, and progress notes. It also includes problem lists, laboratory tests, medications, and radiologic images. As the year progresses, new information is revealed each week so that students develop not only an understanding of their patient's medical conditions but also the time course of disease development and resolution.

The underlying software provides mechanisms for educational links for any patient item. These links can range from simple popup window definition of terms to web documents complex explanations and illustrations. The system also provides for student interaction both in the form of responses to questions and participation in on line discussion groups.

In summary, using the Virtual Clinic promotes the early integration of basic science and clinical concepts with realistic patient cases. At the same time it introduces students to basic clinical informatics concepts such as basic security procedures and use of an EMR for medical decision-making.